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# Rethinking organizational learning: analyzing learning processes of information system designers

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## Abstract

This paper introduces an alternative perspective on organizational learning that counters various assumptions within most of the writings on organizational learning. By posing who, how, when and why questions while reviewing the literature, four biases within the literature on organizational learning are identified. These biases concern respectively an individual learning bias, an active agency bias, a purposeful learning bias and an improvement bias. These hidden assumptions ensure that most literature tends to lean unnecessarily in certain directions, while overlooking others. The paper proposes several ways to counter these biases. A case story concerning the learning of old and new routines used by information systems designers is presented to illustrate the proposed alternative approaches to analyze organizational learning. © 2000 Published by Elsevier Science Ltd. All rights reserved.

**Keywords:** Organizational learning; Information system designers; Old-timers and newcomers; Occupational routines

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## 1. Introduction

The variety of ways to conceptualize organizational learning has produced an ‘organizational learning jungle’ that is getting more and more dense and impenetrable (Prange, 1998). Judging by the still-increasing amount of interest evidenced, for example, by special issues devoted to organizational learning (e.g., *Organization Science*, 1991, 2(1); *Accounting, Management and Information Technology*, 1995; *Journal of Organizational Change Management*, 1996; and *Organizational*

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*Studies*, 1996), there seems to be a need to organize and structure our thinking concerning the concept. This paper too can be seen as a contribution to structure the jungle by analyzing critically the way organizational learning researchers approach the subject and proposing an alternative way of analyzing organizational learning.

Theories on organizational learning should provide answers to or at least suggest ideas to the following related questions: ‘Who learns?’, ‘How do they learn?’, ‘When do they learn?’ and ‘Why do they learn?’ Reviewing the literature with these questions in mind confirms earlier findings that there exist many different viewpoints on the subject (e.g., Dodgson, 1993; Levitt & March, 1988; Huber, 1991; Fiol & Lyles, 1985; Thatchenkery, 1996). More important for the present study is that posing these questions also shows that these contributions to the field of organizational learning are in various respects biased. The biases concern hidden ideas and assumptions behind many writings on organizational learning.<sup>1</sup> As a result of these biases, the received theories on organizational learning lean unnecessarily in certain directions while overlooking others. By analyzing ways they answer the who, how, when and why questions, we have identified four biases of organizational learning researchers.<sup>2</sup>

In this paper we attempt to indicate how these biases could be balanced. A case story is introduced providing an example of an alternative approach to learning. The case story concerns various learning processes that took place at an information system design department at the Netherlands Railways. The purpose of presenting the story is to illustrate how the concept of organizational learning can be approached from a more balanced perspective.

In a way, this paper can be considered an attempt to deconstruct writings on organizational learning. Deconstruction is an activity that has become popular with the work of Jacques Derrida. Derrida’s object in deconstruction is to reveal the ambivalence and double binds that lie latent in any text (Cooper, 1989). Surely, Derrida’s deconstruction of texts is in many aspects different from the present effort to identify biases. Most importantly, different from the present effort, Derrida is not criticizing a text nor is he interpreting it. After all, criticizing and interpreting a text means that one uses an already existing framework, which serves to analyze the texts. In other words, although the attempt is made to free the case story from the four biases identified, every attempt to analyze the literature on organizational

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<sup>1</sup> We do not want to argue that these four biases are an exhausting discussion of possible biases in the organizational learning literature. For example, organizational learning researchers tend to see the organization more from a harmonious perspective in which people like to learn and work together and they tend to treat organizational learning from a Western-oriented viewpoint. Because we use the basic questions as starting point leading to an identification of the four biases, these and many other biases are not discussed in this paper.

<sup>2</sup> Because of these diverse ways in which researchers tend to address the question ‘What is learned?’, we cannot refer to a general assumption or bias from which researchers answer this question. For example, some refer to procedures, routines and rules (Cyert & March, 1963; Levitt & March, 1988), others to knowledge (Huber, 1991; Duncan & Weiss, 1979), while yet others refer to cognitions (Argyris & Schön, 1978; Hedberg, 1981), behavior (Weick & Roberts, 1993) or both (Fiol & Lyles, 1985).

learning is based on one or more assumptions, and this present approach is no exception. Consequently, before starting the discussion on the identified biases, we need to be clear about our own assumptions that lie behind the present text. The alternative approach to organizational learning proposed in this paper has some similarities with an emerging perspective that might be labeled ‘interactionist’ (Elkjaer, 1998) or ‘social constructivist’ (Richter, 1996). This alternative perspective can be seen as the counterpart of the dominant managerial perspective on organizational learning. Such a managerial perspective has a normative character, informing managers how organizations could and should learn (Elkjaer, 1998). The managerial perspective sees learning as valuable since it helps organizations to increase their efficiency and competitiveness. The origins of the perspective can mainly be found in organizational development theories, theories on strategic management and systems theory (Huysman, 1999). An alternative perspective looks at learning as it takes place in situ, situated in ongoing practices within organizations. The perspective is mainly descriptive while it predominantly originates from organizational sociology and cultural anthropology. Although such an alternative perspective has not (yet) been crystallized out, the impression is that it is gaining increased acceptance among researchers. We hope this paper will contribute to the development of an alternative approach to organizational learning, or at least to a rethinking of the way organizational learning is approached in general.

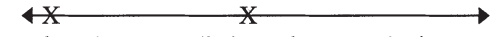
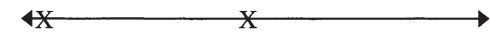
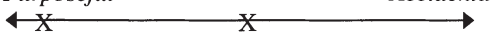

## 2. Identifying biases

Based on the four questions: ‘Who learns?’, ‘How do they learn?’, ‘When do they learn?’ and ‘Why do they learn?’, we shall introduce four biases within the literature on organizational learning and propose ways to counter these biases assuming that a more-or-less balanced view on organizational learning can be introduced. Table 1 provides a schematic picture of this balanced perspective on organizational learning in relation to the organizational learning literature in general. In the third column the four different aspects concerning organizational learning are portrayed as a dimension, ranging from one extreme to the other. Ideal-typically, we have positioned the general literature on organizational learning as represented on one side of this dimension. By positioning the proposed ‘balanced’ perspective in the middle, we imply — again ideal-typically — that this perspective incorporates both sides of the same dimension.

### 2.1. *Who learns?: ‘the individual learning bias’*

Addressing the question ‘Who learns?’ while reviewing the literature leads to an identification of a bias within the literature on organizational learning towards perceiving individuals as the learning agents. Perhaps the most cited controversy within the field of organizational learning is the difference between individual learning and organizational learning (e.g., Kim, 1993; Fiol & Lyles, 1985; Jones, 1995; Hedberg, 1981).

Table 1  
Biases within the literature on organizational learning

Who learns?	Individual learning bias	<i>Individual</i> <span style="float: right;"><i>Organization</i></span>  org.learning 'balanced perspective' literature in general
How do they learn?	Active agency bias	<i>Voluntarism</i> <span style="float: right;"><i>Determinism</i></span>  org.learning 'balanced perspective' literature in general
When do they learn?	Purposeful learning bias	<i>Purposeful</i> <span style="float: right;"><i>Accidental</i></span>  org.learning 'balanced perspective' literature in general
Why do they learn?	Improvement bias	<i>Improvement</i> <span style="float: right;"><i>Decline</i></span>  org.learning 'balanced perspective' literature in general

Some authors support the idea that it is the individual who acts and learns within the organizational framework (e.g., Simon, 1991; Dodgson, 1993). "Individuals are the primary learning entity in firms and it is individuals which create organizational forms that enables learning in ways which facilitate organizational transformation" (Dodgson, 1993, p. 377). Often, the term 'organizational' is taken as referring to the site of learning, as in the term rural or environmental (Jones, 1995). Learning organizations are organizations that create structures and strategies, which facilitates the learning of all its members (e.g., Pedler, Burgoyne & Boydell, 1991; Garvin, 1993; Senge, 1990).

Others consider organizational learning as a metaphor and use individual learning as a model for understanding certain types of collective organizational activity. Although organizational learning occurs through individuals, it should not be seen as a cumulative result of the learning of its members (Hedberg, 1981). Argyris and Schön (1978) argue that organizations do not literally remember, think or learn. If individual member's theories are not encoded in organizational theories, then the individual has learned but the organization has not. A similar assumption is taken by Kim, who argues that "organizations can learn independent of any specific individual but not independent of all individuals" (Kim, 1993, p. 37). Other writers such as Duncan and Weiss (1979), Hedberg (1981), Huber (1991), Weick and Westley (1996), Fiol and Lyles (1985) and Cyert and March (1963) take a similar point of view by accepting the organizational instead of individual aspect of learning while at the same time still claiming that individuals are the principal agents of organizational learning.

In order to overcome this dominance of the individual as learning unit, some have proposed a cultural perspective on organizational learning (e.g., Weick & Roberts, 1993; Weick & Westley, 1996; Brown & Duguid, 1991; Cook & Yanow, 1993). Literature on organizational learning as a cultural process is slim, but seems to be growing (Weick & Roberts, 1993). A cultural perspective focuses less on individual cognition and behavior and more on what goes on in the practice of groups. Cultures of groups and organizations like the cultures of societies, tribes and communities have a collective nature; there is no such thing as the culture of an individual. Consequently, approaching learning as culture has the advantage of focusing on organizational rather than on individual aspects of learning. In the words of Normann (1993): “I would interpret the increasing interest in the concept of culture as really an increasing interest in organizational learning — in understanding and making conscious and effective as much as possible all the learning that has taken place in an organization”.

Organizational learning approached from a cultural perspective can be seen as a process of (re-) constructing organizational knowledge whereas organizational knowledge is seen as shared values, stories, practices, meanings, beliefs, etc. (e.g., Levitt & March, 1988; Pentland, 1995). As will be illustrated with the case story, when learning is seen from a cultural perspective, the level of analysis is the group rather than the individual.

## *2.2. How do organizations learn?: the ‘active agency bias’*

Posing the question ‘How do organizations learn?’ reveals what might be called an active agency learning bias. This bias refers to the tendency within the literature to see learning as an activity in which a single learner learns from the environment and who is more-or-less free to choose how to learn, what to learn and from whom to learn. In fact, this tendency can be divided into two implicit assumptions within the literature:

1. the assumption that learning agents are voluntaristic agents, thereby overlooking issues of path dependency and power that might influence learning; and
2. the assumption that learning is one-way directed, ignoring the mutual character that might influence learning.

It can be stated that many authors who have analyzed organizational learning ignore issues of deterministic forces and consequently provide us with a rather romantic picture of an organization consisting of people able to ‘create the future’ (Senge, 1990). For example: “Learning (...) does not mean acquiring more information, but expanding the ability to produce the results we truly want in life” (Senge, 1990, p. 142). There are at least three ways in which this voluntaristic image is complicated: the influence of the past, the power of dominant coalitions, and the influence of institutional forces.

To a large extent, learning is influenced by past learning. The organizational knowledge that is constructed and reconstructed during the course of its existence

influences the future by determining what new knowledge will be seen as useful to adopt and what knowledge is not (Downs, 1966). However, many organizational learning researchers seem to be rather a-historical. In the next section, while dealing with the purposeful learning bias, we shall return to this aspect of path-dependent or history-dependent learning.

Secondly, dominant coalitions within the organizations have a stake in deciding what knowledge will be considered ‘organizational’ knowledge. In other words, dominant coalitions, being the gatekeepers of organizational knowledge, have the power to ‘objectify’ individual knowledge into organizational knowledge (Berger & Luckman, 1966). As such, dominant coalitions like management or a critical mass of organizational members ‘fill and refill’ the formal organizational memory. Power is an important issue that is often omitted from reports on learning, which assume that learning agents have a free will, not being constrained by forces of power. The case story presented in Section 3 will provide examples of the constraining power of dominant coalitions during learning processes.

Thirdly, learning can be constrained by institutional forces. When the environment from which the organization learns is seen as institutionalized, the learning often involves “adapting to external pressures on the organization to demonstrate that they are acting in collectively valued purposes in collectively valued ways” (Levitt & March, 1988). As the case story will illustrate, institutional environments may influence the ‘free will’ of learning agents.

Another assumption implicit in the received theory on organizational learning, which furthers the active agency, is the tendency to see learning as one-directed: a single learner learns from an exogenous environment. Some authors do, however, argue that organizational learning often involves mutual learning (e.g., Levinthal & March, 1993; Levitt & March, 1988; March, 1991). Learning in one part of the organization interacts with the learning in other parts; learning in one organization interacts with learning in other organizations. In a mutual learning situation, two (or more) learning units adapt to one another. This adaptation often occurs at different rates; quick learners change more than do slow learners (March, 1991). The case story will describe this dynamic interplay between learning of the environment and learning of the organization.

### *2.3. When do organizations learn?: ‘the purposeful learning bias’*

Posing the question ‘When do organizations learn?’ reveals a so-called ‘purposeful learning’ bias. Learning is often referred to as an activity that deliberately takes place and thus can be planned for. For example, Argyris and Schön (1978) and Argyris (1990) argue that, in order to radically change basic assumptions, defensive routines can be brought to the surface when open communication sessions are organized. These organizational development tools can be designed beforehand and can be used in various situations. In with Bateson (1973), the authors refer to so-called ‘deutero learning’ (second-order learning) when dealing with the institutionalization of these learning processes. Institutionalized processes of learning



are to be found, for example, in research and development departments and planning and marketing departments (McKee, 1992).

Another example of deuterio learning that has become popular in today's writing on organizational learning is the 'Learning Organization' concept (Burgelman, 1990; De Geus, 1988; Garvin, 1993; Senge, 1990, 1992; Stalk, Evans & Shulman, 1992; Stata, 1989). Learning organizations are organizations that are deliberately 'created' so as to facilitate the learning of its members. It is often claimed that these learning organizations can anticipate their future learning behavior. Purposeful learning has also been subject to those writers who argue that organizations can learn through the use of information systems. In general, authors within this perspective assert that information systems can be built to support this deuterio or institutionalized learning (e.g., Boland, Tenkasi & Te'eni, 1994; Jelinek, 1979; Johnson-Laird, 1988; Shrivastava, 1983; Stata, 1989).

These and other contributions tend to overlook the more accidental and path-dependent nature of organizational learning. As mentioned earlier, individual members, or specifically managers, are not able to fully engineer the future. Also, organizations are often confronted with internal as well as external unanticipated events. These events limit the possibility of purposeful learning.

A way to challenge the purposeful-learning bias is by approaching learning as being an integral part of the organizational evolution; through learning organizations evolve (March, 1991). Because the course of the evolution depends upon the sequence of particular branches that are realized along the way, organizational learning processes are not easily predicted — with obvious implications for planning processes.

By perceiving learning as an integral part of organizational evolution, the attention is directed away from purposeful learning and more towards the historically dependent, stochastic and emergent nature of learning. This is not to say that learning cannot be planned for. Indeed, most learning processes within organization are planned for, for example when technologies are implemented or when consultants are hired. But when we see learning as an ongoing process, we might become aware of unintentional learning processes that otherwise were left out. The case story provides some illustrations of learning processes that were unplanned and unnoticed by the actors involved.

#### *2.4. Why do organizations learn?: 'the improvement bias'*

Organizational learning has typically been linked to increased effectiveness. Many share the assumption that "learning will improve future performance" (Fiol & Lyles, 1985). This so-called 'improvement bias' refers to the tendency to perceive learning as resulting in positively valued outcomes, treating other outcomes of the same process as less or even not relevant.

The learning curve theory, being one of the first contributions to organizational learning, already assumed that learning results in improvement. Observations done by the US Airforce showed that for a given activity, the hours per unit were found to decrease by a constant percentage each time total repetitions of the activity



doubled (Ascher, 1965). This drop in costs was attributed to learning taking place every time the worker repeated the task. Organizations are believed to have learned when their performances have improved.

Proponents of the 'Learning Organization' such as Garrat (1987), Garvin (1993), Pedler et al. (1991) and Senge (1990) are the most explicit about positively valuing learning. This improvement bias of the Learning Organization theory is apparent already in the definition of a learning organization: "A learning organization is one which improves its knowledge and understanding of itself and its environment over time, by facilitating and making use of the learning of its individual members" (Thurbin, 1994, p. 7); "We conceive of a learning organization as one able to sustain consistent internal innovation or 'learning' with the immediate goals of improving quality, enhancing customer or supplier relationships, or more effectively executing business strategy, and the ultimate objective of sustaining profitability" (Mills & Friesen, 1992, p. 146); "Learning organizations can be seen as a group of empowered employees who generate new knowledge, products and services; network in an innovative community inside and outside the organization; and work towards a higher purpose of service and enlightenment to the larger world" (Marquardt & Reynolds, 1994).

A reason why most of these proponents link learning with improvement is the modernistic believe in prosperity and truth (Thatchenkery, 1996; Addleson, 1996). Much of the literature on organizational learning is directed towards creating 'useful' knowledge. From this modernistic standpoint it directly follows that learning is something to strive for since organizations become more knowledgeable whenever they learn (Prange, 1998).

According to Weick and Westley (1996), organizational learning is often approached as an achievement verb (Sandelands & Drazin, 1989). As a result, it conceals rather than reveals the dynamics of the process of learning. When organizational learning is treated as a process verb, more attention would be given to these dynamics, leaving the issue of whether learning results in positively valued outcomes for further investigation. As some researchers have illustrated, when studying the actual process, learning might just as well result in negatively valued outcomes. For example, organizational learning might result in conservatism or path dependency due to, for example, incomplete learning cycles (Kim, 1993; March & Olsen, 1976), confusion of simultaneous learning (Levinthal & March, 1993), or defensive tendencies among organizational members to protect themselves from open confrontation and criticism (Argyris & Schön, 1978).

Balancing the 'improvement bias' thus calls for studying learning as a process instead of as an outcome. Whereas an outcome perspective focuses on activities that result in organizational efficiency, intelligence and flexibility, a process perspective is more likely to reveal the underlying dynamics of learning which either produce or impede positively valued outcomes. The case story will provide several examples of problematic learning.

### 2.5. *The overall managerial bias*

In the following sections, we shall elaborate further on this alternative perspective. Introducing a case example of learning processes and subsequently analyzing the learning processes from the proposed alternative perspective will do this. However, in order to be able to introduce such an alternative perspective, it should be clear what this perspective is an alternative to. We believe it is possible to identify an overall bias that finds expressions in the four assumptions within the organizational learning literature discussed so far. This overall bias can be found in the managerial discourse that tends to inform the literature on organizational learning (Elkjaer, 1998). This managerial perspective looks at the phenomenon as an organizational activity that can and should be managed in order to improve organizational performances. As such it stimulates the improvement bias within the literature on organizational learning. Managers are more interested in how to improve the organization than in other outcomes of learning processes. The managerial perspective also feeds the dominant image of the individual as a learner. Managers in a learning organizations are supposed to manage the individual cognitions and actions within the organizations in such a way that individuals contribute to the organizational learning processes, for example through education and training and by engaging in self-reflection and open communication (Elkjaer, 1998). A managerial perspective also stimulates the idea that managing is a voluntaristic process (Putnam & Pacanowsky, 1983). Consequently, organizational learning seen from a managerial perspective results in the assumption that learning should be approached from an active agency standpoint; individuals are able to create learning organizations or, in the words of Senge, “The leaders task is designing learning organizations” (Senge, 1990, p. 345). The managerial discourse is perhaps most present within the purposeful learning bias which stimulates a view of learning as a planned and designed activity. Seen from a managerial standpoint, it is more interesting to understand how to improve and stimulate organizational learning processes rather than to describe accidental learning processes.

Although the managerial perspective provides valuable insights and methods, we do believe it necessary to introduce an alternative perspective. Besides counterbalancing the dominance of a managerial approach to learning, an alternative perspective takes into account the dispersed theoretical and empirical insights that organizational learning researchers have gained while studying learning but which are not accounted for by most of the received literature on the learning of organizations. In the following, we shall illustrate our ideas with a case on organizational learning processes taking place at an information system design department.

### 3. **Learning of information system designers, a case story**

The following story is based on a qualitative case study that was conducted at an Information System Design Department at the Netherlands Railways. Attention is centered on how both existing and new occupational routines, as important

elements of organizational knowledge, were constructed, reconstructed or kept in touch during the moment the department was established until the end of study: 1983–1994. The purpose of presenting the story is to illustrate how learning can be approached without the four biases that have been identified above. Specifically, it illustrates a case of learning by studying the developments and influences of the culture of the department. Furthermore, it provides examples of learning influenced by various forces of power and by the occurrence of mutual learning processes. It also illustrates that learning might occur unintentionally and unnoticed. Finally, and also as a result of the above, it provides examples of problematic learning.

Research was based on observations, interviews and document analysis. Data were collected during half a year, for two-and-a-half days per week on average. Almost half of the 50 people employed at the department were interviewed, and most of these interviews were repeated again after several months. Next to the information system designers and the manager, interviews were held with a personnel manager, with some users of the systems designed by the Information System Design Department (the ‘users’), and with the general information system manager of the Netherlands Railways. The interviews had an unstructured character; I asked people to reflect on their experiences in order to delve more deeply into the individual perceptions of the situation. All interviews were tape recorded and fully transcribed. Information was also obtained from documents such as notes of department meetings and policy documents. The manager of the department gave the opportunity to observe the daily activities of the employees by offering me a desk to work on. Thus, observations took place while doing data analysis on one of the desks that was temporarily unoccupied. I changed offices four times, sharing rooms with different groups of system designers, which allowed me to observe their day-to-day activities. Observations took also place during five plenary meetings, and participation in social events such as drinks, lunches, ‘outings’, etc. Important sources of information were gossip and idle talk. In particular, after a month of getting used to each other, people started to perceive me more and more as a confidante.

Because the research is based on recall data, it is possible that the actors gave simplified impressions about their experiences, noticing some aspects while leaving other parts unmentioned and maybe exaggerating other situations. There are various reasons why this problem of hindsight will not influence drastically the descriptions of the social situations of the various actors involved. First, the accounts given by the various members of the department did not differ much from each other. Secondly, one-and-a-half years later, after a presentation of the research findings to some of the actors involved, most system designers felt that their experiences matched the presented research findings. Only the new manager of the department said the findings were not in all aspects in line with what had happened at the department. One reason could be that the case was studied more from the perspectives of the designers than from a managerial perspective. Another explanation could be that the manager was not fully aware what actually was going on among the designers. I return to this point later in the discussion.

The Information System Design Department under study came into existence

in 1984 by splitting up a former computer department — focusing primarily on programming — into programming and design departments. From the members of this former computer department a group of about 25 people was selected who conformed to the job criteria of information system designer, such as the level of education and the years of appointment at the Netherlands Railways.

Although some in-house training courses in information system design were offered, most designers continued using the same standards that guided their previous job as computer programmer. They all had an engineering background, which was needed during their former job as computer programmer and which mirrored the general occupational background at the railways. This engineering conception remained the dominant perspective from which the task related to system designing was approached. For example, when I asked them about the causes of the perceived complexity of their present job, most designers used paper and pen or a blackboard to illustrate how various data fields were interconnected, for example by mapping various existing databases with new systems.

Next to an engineering conception that survived the change in occupation, working more-or-less in solitude was another legacy of their years of programming. Although information system design is usually done in project teams, the former programmers continued to design most information systems on their own. Consequently, the learning that occurred among these former programmers was highly individual; the sharing of experiences only occurred sporadically. As a result, the evolution of the information systems function did not bring about a significant change in the dominant occupational routines.

At the beginning of the 90s the railways introduced a reform policy to ‘double the amount of rails’, which also meant an increase in demand for design and redesign of information systems. System designers were hired on a more permanent basis; new entrants were brought in and the existing group of former programmers was extended. Most of these ‘newcomers’ were hired from outside. As a result of their past educational and professional experiences, these newcomers were in some aspects different from the existing group of designers: the ‘old-timers’. Almost all newcomers were younger than 40 while almost all old-timers were older than 40. Besides age, the new group of information system designers had learned from past experience during their education and previous jobs, occupational routines that contrasted those traditionally employed at the railways. For example, while old-timers mainly perceived their tasks from an engineering perspective, newcomers believed that information system design is a social activity. When asked about the causes of the complexity of the job, newcomers referred to the difficulty in understanding the needs of the users, and with the problem of users not able to foresee what information needs they will have in the future:

Actually we work as sociologists, we constantly try to distillate one reality out of all the different stories users tell us...that seems to be pretty difficult for some people around here.

Because the old-timers shared offices with the newcomers and from time to time

cooperated in projects with them, their work practices made it possible to learn from the new occupational routines that the newcomers introduced. However, these interactions hindered more than stimulated mutual learning processes. As one newcomer remarked:

I know some people of whom I think that given the systems they deliver, that these people...they don't belong here anymore. You see, in the past, a lot of people, people who did not grow up within the age of automation but who happened to roll into it...they obtained some knowledge and have been stuck into it. That's it. They haven't changed a bit. And still they persist in their competence. Really, they're not of much use.

This failure to introduce 'new' occupational routines within the department was partly a result of a dominant coalition that was formed by the old-timers and the manager. Like many old-timers, the department manager had received an engineering education, was a former programmer and had worked for more than 20 years at the Netherlands Railways. According to this manager, things did not need a change; after all, the demand for designing information systems only grew. Consequently, without being inhibited by management, the old-timers continued doing what they always did. Introducing new routines was also blocked by the lack of communication between old-timers and newcomers. For example, attempts of the newcomers to convince the old-timers that the department needed to change, for example by proposing walk-throughs, standard documentation for functional designs, or by proposing the use of standard methodology, mostly ended up in frustration from the side of the newcomers. A newcomer remarked:

So you try to improve the communication yourself. But it's..., maybe it's a cliché, but it has to come from both sides and there are always colleagues, to put it mildly..., well, we sometimes call them a couple of snoozers.

Thus, although the Information System Design Department had the possibility to learn new organizational knowledge, nothing really changed among the old-timers. In contrast, instead of the old-timers learning from the newcomers, the newcomers gradually adapted to the existing work practices that were used by the old-timers. Since past efforts to make a change at the organizational level were mostly suppressed or ignored, they gradually learned to work according to the guiding occupational routines, letting their learned occupational routines go.

Two years after the introduction of a reform plan to increase the amount of services, the decision was made to commercialize the railways; it was time to revitalize the company including the information systems departments. Top information managers of the Netherlands Railways discussed the position, function and strategy of the information systems department. This discussion was also fed by negative outcomes of inquiries held among the users of the information systems. The inquiries made it public that the Information System Design Department was often too late in delivering systems, that the systems did not match the speci-

cations of the users, that the department was considered as operating too bureaucratically, and that designers were accused of hardly ever visiting its customers. Informed by these negative results, top management replaced the department manager by a much younger and highly career-minded manager who belonged to a more professional world of information system design. Unlike most designers who identified themselves with the Netherlands Railways, this manager identified himself more with the world of commercial software houses. He propagated the necessity to become more 'cost-aware, client-friendly and commercially minded' and asked for the participation of the department members in a quality circle program that he had initiated. While some newcomers welcomed these change processes, most designers showed a general lack of interest. This seeming passivity was mainly due to past experiences. From their years of working at the Netherlands Railways, newcomers experienced that their attempts to change work practices were mostly played down. One of them expressed it as such:

I like his (the new-manager MH) ideas, I've proposed them myself more than once, you know. But I want to see it first...I don't want to be the first again, I'm not going to stick my neck out anymore.

In case of the old-timers, past experience was based on 10 to 30 years of working for the Netherlands Railways. During these years, most old-timers learned that a manager primarily controls his subordinates, that communicating informally with these managers is not in order and that you should not run the risk of being perceived as different. Consequently, the new manager's appeal to participate actively in the quality circles was answered by much scepticism. For example, one of the old-timers answered the question as to why he didn't participate in the change process in the following way:

[It] doesn't interest me, look that's for the bosses, it's not my job...I would like to be good in what I am doing, but I am not paid for other things, if so they must pay me more.

The Netherlands Railways also had a history of many reforms that had been initiated but never put into practice. From this experience of 'reforms as a routine' (Brunsson & Olsen, 1993), the old-timers became skeptical about future reform attempts:

...first everything had to be centralized and now everything must be decentralized, soon if it's all decentralized, everything must be centralized, it's a strange experience, I must say.

The manager in turn learned from this expressed passivity and reacted by using more authoritative and oppressive rhetorics:

If they are not willing to change, we do not need them anymore.

At this point, my agreed-upon research period ended. One-and-a-half years later



when the analysis of the research was presented, the department manager had moved to a commercial consultancy firm and was succeeded by one of the newcomers. The department was reorganized significantly without people being dismissed, although some of the old-timers were appointed to another job within the Netherlands Railways or took early retirement.

#### 4. Discussion

In this section I shall discuss how the story provides empirical examples of challenging the four identified biases. In short, the story provides illustrations of an approach to learning that relaxes

- the *individual action bias* by perceiving learning from a cultural perspective;
- the *active agency bias* by perceiving learning as influenced by history, by issues of power and by mutual learning processes;
- the *purposeful learning bias* by acknowledging unnoticed and unintended learning processes; and
- the *improvement bias* by illustrating learning processes that did not result in organizational improvement and intelligence.

In Section 2 it was argued that the *individual learning bias* could be balanced by approaching organizational learning from a cultural perspective. The case story illustrates how the culture of a department was reaffirmed through learning. The case analysis exemplifies organizational learning as a collective rather than an individual activity. Organizational knowledge, such as shared meanings, values and beliefs, comes about and is maintained through interactions among members of the organization. Mostly this knowledge is shared through artifacts of the organizational culture and is often implicit: stories, languages, routines, etc. The knowledge of the group of information system designers did not reside in individual designers but in the group of designers. Because this knowledge has over the years become deeply embedded in the practices of the designers, the group of practitioners has created a shared culture that cannot be reduced to a cumulation of individual characteristics. The case also illustrates the difficulty of changing a group culture and consequently the problem organizations face with re-formation, re-organization, or re-structuring through learning. Although the new group of information system designers was able potentially to change the organization into a new direction, the newcomers were unable to change the existing culture of the group of old-timers.

Thus, besides perceiving culture as a result of learning, culture might also influence subsequent learning processes. To put it differently, culture is past learning and this past learning simultaneously affects future learning. The existing culture of the organization under study heavily influenced the way, for example, old-timers adapted to the new knowledge that was introduced by the newcomers. Over time, this learning created a situation in which the department under study consisted of



two almost separate cultures. The story exemplifies processes of socialization of newcomers and internalization of the organization as learning processes. Newcomers learned from the organization while the organization learned from the newcomers (see also Cook & Yanow, 1993; March, 1991).

Balancing the *active agency bias* is needed to relax the assumption that individuals and organizations are free in choosing how, when and what to learn. The case provides various illustrations of how various deterministic forces that frustrated a picture of learning as a rational engineering activity influenced the learning of the department.

First of all is the influence of the past, which characterized the routine, path-dependent character of the learning at the Netherlands Railways. Past learning of the old-timers, for example, influenced for a large part the way the old-timers learned during the time of research. Without comprehending their past learning, it would have been difficult to understand their present learning. For example, old-timers learned in the past a certain way of relating to managers that had been part of the traditional culture at the railways. These past experiences made it difficult for them to cope with a new manager who almost insisted in their active participation in managerial issues.

Secondly is the power of dominant coalitions in influencing what knowledge will or will not be or remain organizational knowledge. At the Netherlands Railways, old-timers including management acted as important gatekeepers of knowledge. For example, newcomers propagated to the old-timers to communicate more frequently with users, to make use of standard design methodology, to write up end reports and to use 'walk-throughs'. Old-timers, however, did not see any reason to learn from the newcomers. Backed up by management, they had the power to neglect the new knowledge.

Thirdly is the power of institutional forces. When the environment of the organization is seen as an institutionalized one, the reform attempts to commercialize the railways can be seen as a forced learning process. In fact, by reforming its operations, the Netherlands Railways adapted practices that were considered 'modern' at that time. In the 1970s, for example, many reforms were aimed at making organizations more democratic and decentralized and so did the Netherlands Railways. During the 80s and 90s, this normative framework changed radically: the focus switched to efficiency and "the model for attempts at reorganizing the public sector was an idealized picture of private enterprise. The aim of most reform attempts was to improve efficiency by adapting to market forces and encouraging competition" (Brunsson & Olsen, 1993, p. 10). Likewise, during the beginning of the 90s, the Netherlands Railways was influenced by other organizations — mainly through the intervention of the Government as 'owner' of the company — to become a more commercial-oriented organization. The hiring of external consultants, who introduced models of commercialized organizations which they also used when consulting other public organizations that were changing into a commercial company, further triggered this. In a way, the organization was forced by its institutional environment to reorganize and to learn new organizational principles.

Another way to challenge the active agency perspective is to attend to the recip-

rocity between two or more learning units. This ‘mutual learning’ happened at the Netherlands Railways between the group of old-timers and the group of newcomers. In fact, the story illustrates that this ‘mutual learning’ may encourage either convergent or divergent mutual learning processes. In its extreme form, convergent mutual learning involves learners adapting to each other such that they draw closer to each other until they are identical. During divergent mutual learning reinforcement of dissimilarities occurs. Instead of dissolving differences between the various learning units, the differences will be sharpened. Over time, the learning units draw apart from each other. Again, the rate of learning of the learning units influences this process. The mutual learning that occurred among the two groups of system designers can be typified as ‘imbalanced mutual learning’. The old-timers did not seem to learn as much from the newcomers as the newcomers learned from the old-timers. In other words, because some of the newcomers acted as quick learners while the old-timers acted as slow learners, unbalanced convergent learning occurred (March, 1991).

The case story was also free from a *purposeful learning bias*. The story shows that learning is not necessarily a planned endeavor and that the organization was mostly not aware of the occurrence of these learning processes. The story provides descriptions of learning processes that evolved over the last 10 years. Sometimes learning was planned for, for example as was the case with the inquiries among the users of the information systems. Learning processes may also be unplanned and/or unnoticed which was the case, for example, with the mutual learning processes that occurred among the newcomers versus the old-timers. Because individuals are often so much integrated in their day-to-day context, they can become blind to changes at the level of the group or organization that their actions bring about (e.g., Ciborra & Lanzara, 1994). Often awareness may prevent the organization from negatively valued outcomes of learning. For example, one can argue, on hindsight, that if the organization had been aware of the introduction of new knowledge being introduced by newcomers, the occurrence of many problems and reform attempts might have been prevented. Unintentional learning not always results in inefficiencies. Although this clearly seemed the case at the Netherlands Railways, Ciborra and Lanzara (1994) for example illustrated empirically how unplanned learning may indeed foster innovation and change.

As mentioned, approaching learning as a process rather than an achievement can challenge the improvement bias. The discussion up until now implicitly revealed the consequences of studying learning as a process. In fact, the story illustrates several inefficiencies as an outcome of learning, both as a result of being unnoticed as well as a result of institutional forces. For example, the learning among the group of old-timers can be considered as ‘narcistic’. As a group, old-timers were not triggered to adjust to new occupational routines newcomers tried to introduce within the organization. As a result, learning happened within existing cognitive frameworks, overlooking potentially valuable knowledge that did not confirm to these frameworks. Most strikingly perhaps is the negligence of feedback signals from the side of the department manager. Although there were various signals made by the customers who pointed to a discontention, management failed to take these

signals into account. It is not the purpose of this paper to unravel these and much other inefficiency in order to understand the underlying dynamics of learning processes that constitute them. What the story in terms of this present paper illustrates is that by approaching learning as a process instead of as an achievement, its complicated nature might reach the surface.

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